**TReK 5.1.0 Release Notes**

***Note: Configuration files created with the beta software leading up to this release are not guaranteed to work although no issues are known. If you have a trek_workspace that was created using Beta software, it is recommended that you rename or delete the trek_workspace directory in your home directory. A trek_workspace that was created using the TReK 5.0.0 or TReK 5.0.1 software is okay as is and can be used with TReK 5.1.0.***

**Known Issues with TReK 5.1.0**

1. Print from the TReK Assistant (Help) does not work on Windows. This is a known issue with one of the third party software products used by TReK.
2. The IONizer application may crash in some off-nominal scenarios. This problem has been observed when the IONizer application doesn't have the needed privileges on the directory containing the ION configuration files. It is suggested that the IONizer application use configuration files that are located on a local disk. Using a shared drive is possible, but may require additional configuration to allow IONizer to access the shared drive. If you encounter this problem and need help resolving, please contact the TReK help desk.
3. After logging into the HOSC provided VPN client on a 32-bit Red Hat Enterprise Linux 6.x computer, the Device Services API function PopulateIPAddressStructArray() could take up to 60 seconds to return. This function call is also used for the Browse for IP Address dialogs in various TReK applications. Similar behavior is seen for other network applications such as ssh. This behavior was not observed when the VPN client was disconnected. The PopulateIPAddressStructArray() function will now return an empty list and the Browse for IP Address Dialog will now be displayed without any IP addresses on Linux. They will still be populated in Windows. For this release users must type the appropriate IP address into the dialog on Linux.
4. A failover of the HOSC DTN server is not detected by the IONizer application and requires the user perform a manual restart of the ION processes.
5. The IONizer application's proxy option currently has a problem supporting DTN services across an ISS AOS/LOS transition. Communication between the ION ground platform and the HOSC DTN2 server is occasionally broken and is not automatically reestablished. It is recommended that you use the "auto reconfiguration" option instead.
6. There is a known performance issue with loading of metadata from the disk or the database. Loading a few small metadata definitions at one time should not be an issue, but you may notice a delay if loading a large number of metadata definitions or if a metadata definition contains a very large number of parameters. This can occur when using the TReK Data and TReK Command applications or working with metadata through the API.
7. The TReK Metadata application provides limited validation at this time.
8. Linux only: If a TReK application crashes on Linux some resources may not be cleaned up properly at this time. If you have stopped all TReK applications, use these commands to clean up:

   > cd /dev/shm

> rm sem.*

> rm Trek*

If some TReK applications are still running you can selectively remove these resources. For example, if a command application connected to a destination named POIC crashed remove all files in /dev/shm that have POIC in the name.

9. Windows only: If a computer crashes or a hard reboot is forced, files used for shared memory may not be cleaned up properly on a Windows computer. If you have stopped all TReK applications, use these commands to clean up:

   > cd c:/users/<username>/AppData/Local/Temp

   > rem Trek*

10. When using the snapshot statistics view in TReK Data with fewer than 3 packets, extra blank cells are shown.
11. The TReK Playback application toolbar buttons to Activate and Deactivate the playback service can sometimes reflect the wrong state (e.g. Activate may be available when the playback service is already active). If this occurs, the Playback menu can be used to select the function needed. Using the Playback menu will also refresh the toolbar buttons so they reflect the correct state.
12. The batch and script files used for ION do not handle spaces in pathnames correctly. This is only an issue if you have a 'home' directory with a space (e.g., c:/users/my home directory or /home/my home directory).
13. If you find something not in this list, please report to trek.help@nasa.gov.

**Things to Know about TReK 5.1.0**

1. The DTN capabilities that are part of this release require ION-3.6.1 which is available as a Windows installer from SourceForge (https://sourceforge.net/projects/ion-dtn/files/ION-Installer32-3-6-1.zip/download) or Linux RPM from the TReK download site. Newer versions of ION *may* work with TReK, but it is suggested that you maintain the ION version certified with your current TReK version. Running TReK in a Windows virtual machine with the incorrect version of ION is a known problem. Information on TReK releases and their compatible ION versions is maintained on the TReK website.
2. The ERIS simulator is provided to allow you to exercise the HPEG GUI prior to the POIC delivery of HPEG capabilities to remote users. The ERIS simulator does not support multiple connections or reconnecting from the HPEG GUI. You will need to restart the ERIS simulator if you deactivate HPEG.
3. Start scripts are provided on Linux to properly set up the environment before launching executables. If you are using the command line, it is suggested that you use the scripts as well.
4. The TReK CFDP Console application and ERIS Simulator must be started using a command line. These executables are located in the TReK Installation bin directory. Other applications can be started from the TReK menu.

5. A slash is required on the end of both the source and destination path for directory transfers in the CFDP GUI and CFDP Console.
6. The CFDP pause, resume, and cancel actions may appear to take a long time to work depending on the state of the CFDP engine at the time of the request.
7. The current CFDP configuration default values work well for local area network transfers of files when using Native CFDP. However, if you perform file transfers in a non-DTN delay environment, you may need to change the values to always have successful file transfer. In those instances you will get a message about file transfers failing because of Ack/Nak limits being reached or inactivity timeout. It is suggested that you use the auto suspend and resume capability. This will help limit make the transfers more efficient by detected loss of signal (LOS) conditions. See the CFDP document for details.
8. After loading a new version of TReK, you should delete help cache directory (gov.nasa.msfc.trek). The location of the directory is operating system dependent:

   Windows: C:\Users\<username>\AppData\Local\gov.nasa.msfc.trek

   Linux: /home/<username>/.local/share/gov.nasa.msfc.trek
9. The Windows examples delivered are for Visual Studio 2010. They can be updated to newer versions of Visual Studio as required. Please make sure that you get the .lib and .dll files that match the version of Visual Studio you are using.
10. Windows only - The TReK IONizer application will have a console window that opens in addition to the graphical user interface. You will also see console windows for bpecho and trek_hpeg_proxy if those applications are started as part of ION startup.
11. ION configuration files generated on a Windows computer and then moved to a Linux computer can have characters that cause problems with Linux scripting. You can fix this problem with a simple command line in the directory where the files are moved. The command line is:

    ```
    sed -i -e 's/\r$//' *
    ```

    If you see a message with "^M" in it, you will have to use the above command line to fix the problem.
12. It is recommended that you use STCP as the convergence layer for onboard nodes. TCP must be used as the convergence layer on the ground nodes in order to communicate with the ground DTN gateway at the HOSC. *Note: The TReK upgrade to ION-3.6.1 will allow TCP for onboard nodes once the onboard DTN gateway is upgraded to ION-3.6.1. If ISS documentation recommends TCP as the onboard convergence layer, it should take precedence. STCP will still work and is recommended for payloads already validated for flight with STCP.*
13. When using the EXPRESS library, you should get a tool that provides the Rack Interface Controller (RIC) capability. This can be either hardware/software combinations (RAPTR or Suitcase Simulator) or pure software (Common Suitcase Simulator).
14. Windows only: You should copy the required DLLs for any user developed application programs to your run directory or insure that the paths for the TReK installed DLLs will be picked up by your operating system. You can see this list of required DLLs in the TReK Help application for each library. If you fail to do this and have TReK 3.x installed, you could pick up one of the libraries that it installs in the system32 directory. TReK 5.x does not install any DLLs in system32.

15. TReK 3.x required that commands include 2-bytes of data to use for the checksum when sending any command to ISS or an ISS test article. TReK 5.x introduces the concept of a 'trailer' which is used for the checksum. More about how TReK 5.x handles data is available in the TReK Concepts document.
16. This release does not contain an equivalent of the Telemetry or Command Trainer from TReK 3.x. You can still use the TReK 3.x trainers to test the TReK 5.x applications. Don't use the eris_sim_console that is part of TReK 5.x with the TReK Command application. It doesn't simulate the command interface (only HPEG).
17. It is possible for the POIC systems to connect to a TReK Command application multiple times. This can occur when a 'timeout waiting for command connection' error occurs and you reactivate the command connection to try again. This will cause issues with the TReK Command application and it is suggested that you restart if this ever occurs. If this error occurs more than once, it is suggested that you increase the timeout value for waiting for a connection (select preferences from the options menu in the Command application). This will allow more time for the POIC processing to take place prior to abandoning on the TReK side. The default value is 10 seconds (10,000 milliseconds). If you must change the value, it is suggested to wait for at least one minute (60,000 milliseconds).
18. The telemetry partial database convert capability in the Metadata application can convert CCSDS packets with multiple formats, but only one format can be activated in a single instance of the Data application. There are no known users of the telemetry partial database capability.
19. If the TReK Data application is used to record data, and the 'None' packet type option is selected, the user must provide a configuration file that describes the format of the record file prior to playing the recorded data back using the TReK Playback application. The configuration file name must be the record file's base name with a '.con' extension and the file must be located in the record file's directory. The format of the configuration file is identical to the format of the Packet Header Processor (PHP) file and at a minimum, must include information about the size of the packets in the record file. The format of the PHP file may be found in the Record API section of TReK's Online Help.
20. If the VPN connection to the POIC is lost, the HOSC Login, HPEG, and Command applications will deactivate. For Windows the lost connection is immediately recognized and the session is deactivated. On Linux the lost connection is only recognized after the TCP keepalive attempts have been exhausted. This can take up to two minutes. If during this timeframe the user attempts any network related activity (e.g., starting a session or disabling idle check), the keepalive counters reset and it will be another two minutes before the lost connection is detected.
21. The recommended minimum screen resolution for TReK GUIs is 1280x1024.
22. The classes and enumerations provided in the windows namespace of the Telemetry .NET API are deprecated and will be removed in a subsequent release. These items are no longer needed to successfully use the API.
23. If a TReK application configuration file (e.g. TReK Data, TReK Command) is moved from one computer to another, opening the configuration file in a different environment may generate the "Invalid Configuration" error. This error can be generated if the file is invalid or if the file

contains content information (e.g., a directory path, IP address) that is not compatible with the existing environment. If the content is not compatible with the environment, a text editor can be used to correct the content so the configuration file can be opened successfully.

24. The Command GUI can be used to set a flag to allow TReK to behave the same as TReK 3.x with respect to the AddHeaderAndUplinkCommand() function. In TReK 3.x this function required two extra bytes for the checksum. TReK 5.x no longer requires those bytes. The new flag (available on the Preferences dialog in the Command GUI) when turned on will remove those two extra bytes to mimic the TReK 3.x behavior. This will also change the TReK 5.x behavior for the InsertDataAndUplinkCommand() method of the CommandApi class. It should only be used if you are exclusively using the TReK 3.x compatible API.
25. The TReK HOSC Login application and the TReK ERIS Sim Console application use the Transport Layer Security (TLS) for all ports except 9209. As of this writing, the HOSC supports non-TLS logins on port 9209 and TLS logins on port 9219. The TReK HOSC Login application stores the last port number you used. So if you have been using port 9209 this will continue to be the default until you change it. The TReK ERIS Sim Console application's eris_sim_properties.xml configuration file contains a port number configuration parameter that controls the port used by the simulator. If you wish to use TLS with TReK ERIS Sim Console, you can copy the eris_sim_properties.xml file from the install to your home directory and edit the IP address.
26. The CDEF schema changed after the 0.9.0 beta was delivered. Any CDEF files created with the previous version of the schema can be read in using the old schema file (CDEF-1.1.xsd) when importing in the Metadata application. All exported CDEF files will use the latest schema (CDEF.xsd).

If you discover anything that is not on the list, please contact the TReK Help desk at trek.help@nasa.gov.

**Release History**

*Note on bug numbers: Starting with TReK Release 5.0.1 bug numbers are included with bug fixes. The bug numbers will have gaps as some bugs are not delivered and the same numbering system is used to keep track of help desk calls.*

The following is a summary of the changes associated with each TReK release. Details on new capabilities and changes are available in the documentation for the appropriate item.

- Version 5.1.0:
  - Notes:
    - See bug fixes.
    - This version is compatible with the latest EHS release as of the date for the 5.1.0 release.
  - New Processes or Libraries:
    - None
  - Updated Processes or Libraries (includes change requests):
    - HOSC Login GUI – Added capability to use TLS sockets.
    - Metadata GUI – Added CDEF import and export.
    - IONizer GUI – Updates to support ION 3.6.1.
    - IONconfig GUI – Updates to support ION 3.6.1
  - Bug Fixes:
    - Bug 864 – Telemetry databases created from partial database downloads now create an additional parameter for the data zone of the packet with a length corresponding to the length of the packet. This allows the Data application to automatically calculate the length correctly. In previous releases, some packet may have required users to identifier the length prior to activating the packet.
    - Bug 871 – The Command application now writes warning messages when a configuration file is opened that references metadata files that cannot be found.
    - Bug 875 – The CommandApi::SendBinarayCommand method now rejects zero length buffers.
    - Bug 879 – Some figures in the Metadata Tutorial were updated to align with the current version of software.
    - Bug 881 – The migration guide now has information about copying DLLs into user application directories.
    - Bug 902 - The Metadata application's 'Convert EHS Partial Database into TReK Database' capability did not work correctly when the path for the new database was outside the trek workspace. When this scenario occurred, the Convert created the database but it did not contain the correct information and the Convert dialog did not display any messages in the dialog message area. This has been fixed.
    - Bug 903 – Processing of random subset data (e.g., APID 876) could cause the displays to show some data is missing. Data from any subset can now be used.
    - Bug 904 – String data types were incorrectly converted from EHS partial database files. Also, the SEXP data type from MSFC-STD-1274 was mapped to SFIXED instead of SNULL in the TReK database.
    - Bug 933 – The "Convert EHS Partial Database Files Into TReK Database" dialog in the Metadata application was updated to correct the formatting of the error message displayed when the partial database files cannot be located.

- Bug 934 – The “Configure” dialog in the Command application now saves Firewall information.
- Bug 936 – Additional information explaining the location and purpose of the CFDP Dropbox Successful Path Location was added to user guides and online help.
- Bug 946 – The TReK Command application now sets all configuration fields back to the default value on File New.
- Bug 948 – The “Convert EHS Partial Database Files Into TReK Database” dialog in the Metadata application was updated to correct the formatting of the error message displayed when command partial database files cannot be located.
- Bug 967 – Updated the Metadata application to make the Database Name field on the Database tab read-only since this field should not be modified by typing in the field.
- Bug 981 – The EXPRESS API was updated to fix a timing issue that could cause the API to not detect the RIC connection.

➢ Version 5.0.1:

- Notes:
  - See bug fixes.
  - This version is compatible with the latest EHS release as of the date for the 5.0.1 release.
- Bug Fixes:
  - Bug 810 - The Parameter dialog in the TReK Data application now only displays the correct packet key/parameter combinations. It was possible in some cases for an incorrect combination to be shown. If an incorrect parameter/packet key combination was selected when defining a custom display or monitor set, the parameter value could not be displayed or monitored.
  - Bug 811 - TReK Data Displays can only support data values up to 1024 characters. In previous versions displaying a value larger than this would lock up the application. This issue is resolved.
  - Bug 814 - The RAPTR/PRCU destination for commanding now uses the correct length when sending a command to RAPTR or PRCU.
  - Bug 815 – Application specific help for the HOSC Login application did not work for Linux.
  - Bug 816 - The TReK 3.x compatible Command API function AddHeaderAndUplinkCommand() could not be run without modifying user code. TReK 3.x required an extra two bytes for the checksum to be provided which is no longer needed in TReK 5.x. The default behavior in TReK 5.x is to send the data exact as received by the AddHeaderAndUplinkCommand() function. A change has been made to provide a TReK 3.x API Compatibility mode. This change is described in the Things to know section in the release notes, the Command User Guide, and the API documentation.

- Bug 818 – The Getting Started Guide was updated to include descriptions for the template and licenses directories in the install.
- Bug 820 – A Data Format column was added to the Command Update dialog in the Command application, the Collection Tab in the Metadata application, and the Packet Tab in the Metadata application. The Metadata application Parameter Details dialog was also updated to include a Data Format option.
- Bug 821 – Updated the libraries help to change the maximum time that can be represented on Linux to the year 2038.
- Bug 826 – GetNext…() API functions did not properly loop through the data if the 'next' parameter was not available in a packet leading to confusing error codes and the possibility of missing data. The functions will now internally loop to find the next parameter in the packet. If the last packet in the queue contains the requested parameter, a subsequent call will return SUCCESS and produce a stale status character. If the last packet in the queue does not contain data, the function will return 'no data available' (i.e., there are more packets, but none contain the data requested).
- Bug 829 – The examples for GetNextConvertedIntegerValue, GetOneNextRawValue, GetOneNextCalibratedDoubleValue, GetOneNextCalibratedStringValue, and GetOneNextConvertedStringValue in the libraries help were updated to include other return codes that can indicate success.
- Bug 832 – The AddHeaderAndUplinkCommand function in TReK 3.x did not require a single modifiable field to work. In TReK 5.0 it required a single modifiable field. The underlying code CommandApi::InsertDataAndSendCommand was updated to allow any command to be used. A temporary single modifiable field command is automatically created by the method to enable all commands to be used with these APIs.
- Bug 833 – If a POIC string was configured to use a simulated time an error message was returned when sending commands indicating the time stamp was not within +/- one minute of the POIC time. POIC destinations now continuously resync an internal offset to properly set the time stamp for all messages to the POIC.
- Bug 834 – (This bug is only applies to TReK code used as part of the On-Demand Test Environment (ODTE)). The ODTE TReK Command Bridge would not start correctly if a hard kill was performed on the code crashed. Additional code was added to remove the resources that were causing the issue.
- Bug 835 – The Metadata User Guide and Online Help were updated to include information about the EHS Partial Database Import capability.
- Bug 847 – The Data application now saves the number of buffers and buffer length information from the process tab.

        - Bug 851 – The TReK Data Configure dialog did not respond to a double click in the value column after the value was modified. This has been corrected so that double clicking in the value column will always enable cell editing when the Apply checkbox is checked.
        - Bug 852 – The TReK Playback application now correctly applies the packet transformation before forwarding the packet.
        - Bug 856 – The TReK Metadata application did not correctly clear memory after a File New. Parameters defined on the Collection tab prior to the File New would reappear after a New configuration was performed and the Parameter Details dialog was accessed. The Metadata application now correctly clears memory after a File New.
        - Bug 859 – The TReK Data application now writes a more specific error message when a configuration file fails to load due to a missing metadata file referenced in the configuration file.
        - Bug 865 – The TReK Metadata application now generates an error message if length information isn't set when the Details button is pushed on the Collection tab.
- Version 5.0.0:
    - Notes:
        - See bug fixes.
        - This version is compatible with the latest EHS release as of the date for the 5.0.0 release.
        - See Known Issues for important note about DTN.
    - New Processes or Libraries:
        - Command GUI
        - Command ANSI-C API (Release 3.x Compatible)
        - Command C++ API
        - Command .Net API (Release 3.x Compatible)
        - Data GUI
        - Telemetry ANSI-C API (Release 3.x Compatible)
        - Telemetry C++ API
        - Telemetry .Net API (Release 3.x Compatible)
        - Record API
        - HOSC Login GUI
        - Metadata GUI
        - Playback GUI
    - Removed Processes or Libraries:
        - GSE Convert GUI – this functionality is now part of the Metadata GUI
    - Updated Processes or Libraries (includes change requests):
        - CFDP Console – Two versions are now available. The original version (trek_cfdp_console) is the same and allows for command line input and output.

The new version (trek_cdef_console_bg) is intended for use in scripts when user interaction is not needed.
        - HPEG GUI – The login is now part of the HOSC Login GUI to allow logins to be shared with the Command GUI.
    - Bug Fixes:
        - New scripts are provided for ION (DTN) that will allow auto reconfiguration of ION without the use of the TReK DTN Proxy. Occasionally the proxy would have issues after an LOS period. The proxy is still available for use, but the auto reconfiguration is now the recommended method to connect to the POIC for DTN.
- Version 4.4.0:
    - Notes:
        - See bug fixes.
        - This version is compatible with EHS 19.x – 22.x.
        - See Known Issues for important note about DTN.
    - New Processes or Libraries:
        - CFDP Service (Windows only)
    - Updated Processes or Libraries (includes change requests):
        - Added drop box capability to CFDP Software (Console, GUI, Library, and Service)
    - Bug Fixes:
        - The IONizer application will no longer erroneously report a missing process when running without a proxy. You must regenerate your configuration files to eliminate the issue. Also, missing processes are only reported once instead of every second.
- Version 4.3.0:
    - Notes:
        - See bug fixes.
        - This version compatible with EHS 19.x, 20.x, and 21.x
    - New Processes or Libraries:
        - HPEG API
        - GSE Convert GUI
    - Updated Processes or Libraries (includes change requests):
        - Added a new data type for EHS Converted Time to the Data API to support GSE Packets.
        - Parameter::GetValueAsString() will now return enumerations strings when available.
    - Bug Fixes:
        - Corrected memory leak in the CFDP Native library.
        - Packet::Extract() will no longer return an error if a zone is composed of a single variable length parameter and the length of the parameter is zero.

        - Enumerator::Get() will now return the minimum required buffer size if TREK_DATA_NOT_ENOUGH_SPACE is the return value.

- Version 4.2.1:
    - Notes:
        - See bug fixes.
        - All bug fixes are associated with HPEG and are not required for flight configurations.
        - This version compatible with EHS 19.0 and 20.0.
    - New Processes or Libraries:
        - None (bug fixes only)
    - Updated Processes or Libraries (includes change requests):
        - None (bug fixes only)
    - Bug Fixes:
        - HPEG application now queries POIC for user authentication timeout and informs user that re-authentication is required.
        - Linux issue with multiple user accounts and HPEG resolved.
        - HPEG now activates if POIC configuration does not match user account capabilities.
        - IONizer works on slow computers.
- Version 4.2.0:
    - Notes:
        - Added EXPRESS library.
        - This version compatible with EHS 19.0 and 20.0.
    - New Processes or Libraries:
        - EXPRESS Library
    - Updated Processes or Libraries (includes change requests):
        - None
    - Bug Fixes:
        - Bugs found during beta testing.
- Version 4.1.0:
    - Notes:
        - Added Delay Tolerant Networking (DTN) Capability.
        - Updated HPEG interface with POIC. This version compatible with EHS 19.0 and 20.0.
        - Added TCP keep alive support.
        - Add support for spaces in filenames or path for CFDP file transfer functions.
    - New Processes or Libraries:
        - IONconfig Application
        - IONizer Application
        - IONizer Library
    - Updated Processes or Libraries (includes change requests):

        - CFDP Application
        - CFDP Console Application
        - CFDP Library
        - Device Services Library
        - HPEG Application
    - Bug Fixes:
        - Minor fixes for off-nominal conditions in CFDP library.
        - Minor fixes for return codes in Device Services library.
        - Bugs found during beta testing.
- Version 4.0.0:
    - Notes:
        - Initial capabilities
    - New Processes or Libraries:
        - CFDP Application
        - CFDP Console Application
        - CFDP Library
        - Data Library
        - Device Services Library
        - ERIS Simulator Console Application
        - HPEG Application
        - TReK Assistant Application
        - User Calibrator Generator Console Application
    - Updated Processes or Libraries (includes change requests):
        - None (initial release)
    - Bug Fixes:
        - Bugs found during beta testing.